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INTERNATIONAL GEOPHYSICAL COOPERATION PROGRAM -- SOVIET-BLOC ACTIVITIES

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I. GENERAL

Interdepartmental Conference on Thermal and Water Regime of Earth's Surface

The Interdepartmental Conference on the problem of the "Thermal and Water Regime of the Earth's Surface, Its Role in the Dynamics of Natural Phenomena and Methods of Conversion for Practical Aims" was held in Leningrad from 7 to 11 April 1959. The conference was organized by the Institute of Geography of the Academy of Sciences USSR and the Main Geophysical Observatory imeni A. I. Voyeykov. Scientific workers directly occupied with investigations of problems concerned took part in the conference ("Conference on the Problem of the 'Thermal and Water Regime of the Earth's Surface, Its Role in the Dynamics of Natural Phenomena and Methods of Conversion for Practical Aims,'" by A. P. Gal'tsov; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya, No 5, Sep/Oct 59, pp 133-134)

Joint Soviet-Chinese Conference on Problems of Physical Geography of Amur River Basin

The third session of the Joint Soviet-Chinese Council on Problems of the Amur River was held in Moscow, 7-12 May 1959. The results of the complex scientific research work of these two expeditions during the past 3 years were presented.

Reports were heard on the problems of geomorphology and paleogeography, soil geography, and plant geography.

A proposal for future Soviet-Chinese investigations was accepted at the final session. ("Problems of the Physical Geography of the Amur Basin at the Third Session of the Joint Scientific Council of the Amur Expedition of the Academy of Sciences and the Heilungkiang Expedition of the People's Republic of China," by V. P. Chichagov; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya, No 5, Sep/Oct 59, pp 136-139

II. ROCKETS AND ARTIFICIAL EARTH SATELLITES

Soviet Announcement of Successful Pacific Missile Shot

Following is the statement on the successful launching of the first Soviet ballistic rocket in the Pacific tests by Academician N. Muskhelishvili which appeared in Pravda of 23 January 1960.

"The Soviet people note with deep satisfaction the successful testing of a more powerful Soviet multistage ballistic rocket intended for launchings of heavy artificial earth satellites and flights to planets of the solar system. Again all the world is astonished by the outstanding successes of Soviet science and engineering, and first of all, indeed, by the sniper accuracy of the flying missile. The rocket, having traveled 12,500 kilometers along the surface of the Earth, deviated from its given goal by a distance of less than 2 kilometers!

"These are astonishing results. They testify not only to the high accuracy of the mathematical calculations but also to the reliable, irreproachable operation of all of the rocket's mechanisms, and especially the guidance system directing its flight. And this is the best testimonial to the productive activity of our scientists, designers, engineers, technicians, and workers and the best confirmation of the broad capabilities of our machine building, instrument building, chemical, and other branches of industry. This great victory once again confirms that our scientists are proceeding along the correct path for the harmonic union of thorough theoretical research with fine experiments.

"The successful testing of the new ballistic rocket indicates that Soviet scientists have at their disposal a still more powerful means of investigating the endless depths of the Universe.

"The new victory of Soviet science and engineering once again confirms the pre-eminence of the socialist system and the unprecedented enthusiasm of our scientists, engineers, and workers." ("Astonishing Results," by Academician N. Muskhelishvili; Moscow, Pravda, 23 Jan 60, p 1)

Blagonravov Interview Hints "Cosmic Experiments" in September

Armand Montagne, special correspondent for the Marseille Communist daily La Marseillaise in Nice on the occasion of the First International Congress on Space Science, obtained an interview with Professor Blagonravov, head of the Soviet delegation to the congress, which was published in the 17 January issue of the paper.

Montagne reported Blagonravov as saying that Soviet scientists are working very hard on the problem of cosmic rays and that they are particularly interested in the influence of these rays on the terrestrial atmosphere and in their effects around the Earth. Stressing the usefulness of the Nice congress, Blagonravov said that cooperation in research is very useful for the exchange of opinions between scientists of the entire world and also for the verification of ideas and results obtained. "There are no differences between American and Soviet scientists," he said. "Their theses are in agreement. The discussions cover only

secondary points." Professor Blagonravov said that he thinks that American scientists will have to agree with the Soviets in the matter of the radiation bands, because the Soviet results in this matter have been more extensively verified, he said, thanks to the cosmic rockets the USSR launched early in the year. "There is also agreement in the appraisal of their results and ours," he said.

In answer to a question on when Man will go into space, he answered that the experiments must be extended so as to assure complete safety for Man his return to Earth. He added that it will be necessary to know everything about the Moon before approaching Mars and Venus. He said September will be a favorable month for cosmic experiments, but added, "I cannot tell you what we will do at that time."

Professor Blagonravov then discussed the problem of space medicine saying that the USSR has carried on biological experiments for many years and has gathered much material on the subject, especially on the behavior of the organism, acceleration, weightlessness, etc. "It is not necessary to cross through the radiation belts," he continued. "One can, in effect, choose the approach since the radiation belts are concentrated on the equatorial and neighboring waves [sic], and one can go via the poles."

After saying that it is not known how much of radiation the dog Layka was subjected to, Professor Blagonravov concluded: "There is no radiation belt around the Moon. In any case, the magnetic field must be very weak. It is very difficult to judge exactly because the measuring instruments are not too precise in the extent of their sensitivity. It will be necessary to wait for new more perfected instruments to reveal this magnetic field, if it is small, and if it exists." ("To Know Everything About the Moon Before Approaching Mars and Venus, Professor Blagonravov Tells Us," by Armand Montagne; Marseille, La Marseillaise, 17 Jan 59)

Polish Scientist Expects Early Mars Shot by Soviets

In an interview with the Polish news agency PAP, Prof Jan Gadomski, specialist in astronautics, expressed his belief that the experiments which Soviet scientists will carry out soon in the Pacific will be connected with the launching of a rocket toward Mars.

The Polish scientist added that the best date for the launching is 16 April since it would take 258 days for a rocket to reach Mars on 30 December when the planet is closest to Earth (56 million kilometers).

The speed to reach Mars, said Professor Gadomski, must be exactly 11,590 meters per second. ("According to a Polish Scientist the Soviets are Likely to Send Rockets to Mars Soon"; Paris, Le Monde, 13 Jan 60, p 2)

Soviet Rocket Progress Reviewed in Czech Article

An article which purports to review progress made by Soviet scientists in the field of astronautics appeared in the 25 December 1959 issue of Obrance Vlasti, Czech newspaper. Part of the text attributes certain statements and postulations to "information provided by Soviet scientists" and claims that information thus far published would indicate that "Soviet scientists are obviously working on or even applying the theory of electromagnetic propulsion for the initial launching of their space vehicles."

Citing the Soviet-applied payload-to-propulsion requirement ratio of 1:100, the article speculates that at this rate the rocket which launched Lunik II would have to weigh 300 tons at blast-off. According to the article, an electromagnetic launching device in the form of a huge coil charged with alternating current would be capable of producing a large magnetic field and, at the expenditure of hundreds of kilowatt-hours of electric energy, produce sufficient thrust in 20-25 seconds to achieve the launching of a space vehicle.

The article states that because the Soviet Luniks maintained their precalculated courses so well it is believed that the Soviets have solved the guidance problem. According to the article, the Luniks had two guidance systems, a ground remote-control system, and a built-in automatic compensating system. ("Sensational Progress of Soviet Astronauts"; Prague, Obrance Vlasti, 25 Dec 59, p 3)

Czechoslovak Astronomer Indicates Soviet Pacific Test Shoot Launching Site

In an article generally discussing the purpose of the announced Soviet test firings of rocket vehicles into the Pacific Ocean, Dr L'ubor Kresak, identified as a member of the Astronomic Institute of the Slovak Academy of Sciences, indicates the launching site for the tests. He begins his article by stating that "The rockets will follow the same trajectory as that followed by all previous Soviet satellites and cosmic rockets. They will be launched in a northeasterly

direction; their flight path will gradually turn eastward over Siberia, that is, over the 65th parallel, the trajectory will turn toward the southeast; the rockets will cross over the coastline into the Pacific area north of Japan and will re-enter the thick strata of the atmosphere to the south of the Hawaiian Islands."

("The Attack on the Universe Continues," by Dr L'ubor Kresak; Bratislava, Pravda, 11 Jan 60 pp 1-2)

III. UPPER ATMOSPHERE

New Telescopes for Crimean Astrophysical Observatory

The largest astronomical instrument in the USSR, a reflector telescope with an aperture (mirror diameter) of 1.25 meters, has been installed in the Crimean Astrophysical Observatory of the Academy of Sciences USSR, according to a report in Pravda.

In addition, says the article, the mirror for a new telescope is now being manufactured in the Optical-Mechanical Plant in Leningrad. The new mirror's diameter is 2.6 meters and it weighs more than 4 tons. The mechanical framework of the telescope is higher than a four story building.

A. B. Severnyy, Corresponding Member of the Academy of Sciences USSR and chairman of the state commission for accepting the reflector, gave the following interview to a Pravda correspondent.

"The famous designer of native reflectors, B. K. Ioannisiani, Lenin Prize winner, and a number of other scientists and designers united in a special committee for the construction of the telescope under the Academy of Sciences USSR. This committee was headed by Prof V. B. Nikonov. The new reflector telescope was named in memory of Academician G. A. Shayn, outstanding Soviet astrophysicist.

Plant testing of the mechanical part and the mounting system has been successfully concluded. The telescope will soon be transported to the Crimean Astrophysical Observatory.

The reflector will be installed in a special tower with a rotating dome. On completion, the reflector telescope will open new and greater possibilities to Soviet astronomers for studying the cosmic processes going on in distant stars and galaxies. The reflector is also equipped with special instruments for studying the planets of our solar system and cosmic rockets." ("Telescope-Giant"; Moscow, Pravda, 21 Jan 60, p 4)

Picture of Reflector for Crimean Telescope

A picture in the 12 January 1960 Pravda taken in the Leningrad Optical-Mechanical Plant, where the newest zenith telescope "ZTSh" for the Crimean Astrophysical Observatory is being built, shows workers inspecting the unique reflector of the telescope. (Moscow, Pravda, 12 Jan 60, p 2)

"Kosmicheskiye Dannyye" (Cosmic Data) for March, April, and May

The reviews, Kosmicheskiye Dannyye, for March, April, and May 1959 have been published. They contain the results of observations of geophysical phenomena connected with the electric and magnetic state of the upper atmosphere (geomagnetic variations, the ionosphere, cosmic rays, earth currents) for the above months. The work is compiled by the Institute of Terrestrial Magnetism, the Ionosphere and Radiowave Propagation (NIZMIR). (Kosmicheskiye Dannyye, No 3(37), 4(38), 5(39); Moscow, 1959)

Hungarian Astronomers Gather Data on Moon and Saturn

Hungarian astronomer Lajos Bartha reports, among other topics, that workers at the Urania Observatory gathered valuable data concerning volcanism of the ring mountains on the Moon. They noted that the spots which develops at eruption sites reflect sunlight in a manner similar to volcanic rocks. They also made valuable observations in connection with the shadow phenomena of Saturn's rings. ("Eight Comets Will Return From Space"; Budapest Magyar Nemzet, 1 Jan 60; p 2)

IV. GLACIOLOGY

Conference on Glaciers in the Kirgiz SSR

A conference of geographers organized by the Tien Shan High-Mountain Physicogeographical Station of the Academy of Sciences Kirgiz SSR was held in the village of Pokrovka, located in the Dzhety-Oguz Rayon of the Kirgiz SSR. The conference was devoted to a study of problems in glacier dynamics and was attended by scientific associates of the station, as well as representatives of the Division of Geography of the Academy of Sciences Kirgiz SSR and the geographical faculty of the Kirgiz State University.

Primary attention was devoted to studies of the intense recession of glaciers in the Tien Shan mountain range in the past two decades. Through the use of a phototheodolite method with repeated photographs of glaciers, stereoautographs, and data from literature on glaciation in the Tien Shan, S. M. Myagkov established that in the period from 1943 to 1957, the glacier of Davydov receded at an average speed of 27 meters per year. Information on the decrease in dimensions of the glacier Yuzhnyy Karasay was presented by L. G. Bondarev. R. D. Zabiron explained the relationship between the lower boundary of zero balance and the dynamics of a glacier. It is claimed that a mathematical interpretation of this relationship will make it possible to calculate precisely the rate of glacial degradation and predict the behavior of glaciers, not only in mountain regions, but also in flatlands of polar countries.

Through a study of plant cover, N. D. Kozhevnikova established regularities in the geographical distribution of various families of plants in the Bol'shoy Naryn River Basin. S. B. Bayguttiyev reported on physicogeographical conditions of the Verkhniy Narym and Sarychatskiye [sic] [illegible]s. Information on the results of meteorological observations in the Chong-Kizylsu River Basin during the International Geophysical Year was presented by A. K. Kadyraliyev. ("Study of the Dynamics of Glaciers" (unsigned article); Moscow, Vestnik Akademii Nauk SSSR, No 11, Nov 59, pp 71-72)

Interdepartmental Conference on Glaciation in the Caucasus

The Interdepartmental Working Conference on Present and Old Glaciation in the Caucasus was held in Moscow on 23-25 April 1959. Representatives of a number of scientific institutes and universities participated, and a number of scientific reports were given.

Certain measures for better coordination of the work of the different institutions for studying Caucasus glaciation were planned. It was decided, in particular, to conduct yearly interdepartmental conferences with field excursions for solving debatable problems. The first of these conferences is scheduled for 1960 at the El'brus station of the Moscow State University. ("Interdepartmental Conference on Glaciation in the Caucasus," by D. A. Liliyenberg; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya, No 5, Sep/Oct 59, pp 134-136)

Method of Measuring Flow Rate of Glacier Surface Ice

The study of ice movement in glaciers is provided for under the glaciological research program of the IGY. The use of aerial surveying in this work has been added to the usual methods. It is particularly adaptable in the polar regions where glaciers reach enormous sizes and where the use of other methods is not feasible.

The current study, an analysis of the first application of this method (L. D. Dolgushin," Glaciological Observations in the Antarctic," Izvestiya Akademii Nauk SSSR, Seriya Geogr., No 6, 1958), is undertaken with the aim of perfecting the method to ensure higher accuracy in future work.

Aerial photographs taken during two flights of the Aerial Survey Unit of the Soviet Antarctic Expedition 12 1/2 months apart (1956-1957) were processed. The identical points obtained on the photogrammetric base were matched, and the distances between them were represented as vectors characterizing the direction and magnitude of the linear displacement of the contour points, lying on the surface of the glacier, which occurred in the time interval between the two flights. According to measurements on the plan of the magnitude of each vector and the known interval of time between the two flights, the velocity of the surface motion of the ice at each point on the glacier identified on the aerial photographs was easily determined. Then, using these data, it was possible to draw isolines of the different velocities (equal-velocity lines) and thus reveal the zones of different surface velocities for the movement of the ice.

This method of obtaining vectors, making it possible to judge the direction and the magnitude of linear displacement of the glacier surface, is the most simple and practicable in conditions when one is obliged to operate with very limited and incomplete original data.

The proposed method permits the study of the dynamic elements of the surface ice of sheet-type glaciers embracing considerable areas and, on the strength of this, eliminates the need to use rather dense systems of permanent bearing points located most advantageously in relation to the glacier from the viewpoint of photogrametric requirements.

A number of suggestions are made for increasing the accuracy of determining the velocity and direction of surface movements of glacier ice by aerial surveying.

First, the survey routes must be parallel to each other and tied-in to a map. Photogrametric operations must be made from the negatives. By obtaining vectors from the negatives, accuracy is doubled, since the

error caused by deformations in photographic paper is larger than all other errors. The direction of the survey flights should be near a perpendicular to the direction of the glacier's movement, and during the survey, readings of the radioaltimeter and statoscope must be recorded. In the absence of outcrops of bedrock, which are used as orientation points, it is possible to tie in the ends of the survey lines by means of aerial radiogeodetic means.

Adherence to these conditions will permit, during photogrammetric processing, the applying of photopolymetry as a means of ensuring the compilation of a photogrammetric base necessary in determining the location and dimensions of the vectors. ("Method of Measuring the Ice Flow Velocities of the Superficial Parts of Certain Antarctic Glaciers According to the Material of Double Aerial Surveys," by V. I. Sil'nitskaya and G. D. Cheremnykh, Institute of Geography, Academy of Sciences USSR; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya, No 5, Sep/Oct 59, pp 90-95)

V. OCEANOGRAPHY

First Sounding Rocket Fired by Voyeykov in Pacific

The Soviet expeditionary ship Voyeykov, belonging to the Main Administration of the Hydrometeorological Service USSR, according to a radio report, fired its first meteorological rocket on 17 January. The ship, which left its native shores on 10 January for a long voyage of investigations, is presently in the western part of the Pacific Ocean. Extensive meteorological, aerological, and oceanological observations are being conducted on a 24-hour basis despite continuously stormy weather. ("Scientific Observations in a Stormy Ocean"; Moscow, Pravda, 20 Jan 60, p 6

VI. SEISMOLOGY

Book on Seismic Research

A description of the correlation method of refracted waves (KMPV), one of the basic methods of seismic prospecting, is contained in the book Korrelyatsionnyy Metod Prelomlennykh Voln (Correlation Method of Refracted Waves), a manual for engineers and seismic prospectors, by G. A. Gamburtsev, Yu. V. Riznichenko, I. S. Berzon, A. M. Yepinat'yeva, I. P. Pasechnik, I. P. Kosminskaya, and Ye. V. Karus. The physical basis of the method, features of the apparatus, the methodicity of field observations, and the method of interpreting the material are presented. The possibilities of using the method in prospecting are discussed, a comparison of the method with other seismic methods is made, and a system for using KMPV together with other seismic methods of reflected waves is indicated.

The book is recommended as a manual for engineers-seismic prospectors and can be used as a text book for students specializing in geophysics. (Korrelyatsionnyy Metod Prelomlennykh Voln, by G. A. Gamburtsev, Yu. V. Riznicheko, I. S. Berzon, A. M. Yepinat'yeva, I. P. Pasechnik, I. P. Kosminskaya, and Ye V. Karus; Moscow, Publishing House of the Academy of Sciences USSR, 1952, 239 pp.)

VII. GRAVIMETRY

Gravitational Anomalies and Tectonics

On the assumption that an analysis of the gravitational field into its components gives a more detailed than usual indication of the connections between structural elements and the gravitational field, this article presents and explains an isoline chart of the gravitational effect of the sedimentary stratum of the Volgo-Kamsk region based on calculations of the gravitational anomalies of 1,100 points distributed uniformly over the entire platform, with an average spacing of one point per 35-40 square kilometers. The anomalies were calculated on the basis of the formula for a horizontal layer of infinite spread, with the assumption of a constant thickness of the cross section of the sedimentary complex and igneous basement, with a difference of 0.3 gram per cubic centimeter at the contact surface.

The average density of the sedimentary deposits was assumed to be 2.45 grams per cubic centimeter, which agrees completely with data of the most recent investigations.

The chart gives an idea of the gravitational influence of the sedimentary deposits or, in other words, of the roof of the relief of the igneous basement of the Volgo-Kamsk region. If, on the basis of observations on gravitation charts, the fluctuations of the anomalous field amount to 100 milligals, then, on the chart showing the gravitational effect of all sedimentary masses, the corresponding fluctuations amount to a total of only 25 milligals. This means that the maximum variation of thickness of the sedimentary complex causes an anomaly on the order of 25 percent with respect to the general gravitational effect. The gravitational effect of the sedimentary deposits in the eastern regions differs essentially from the anomalous effect in the central regions, which indicates a different age of the igneous basement on the eastern and western platform.

In the region of the Tatar anticline, the gravitational effect of the sedimentary complex accounts for only 7-10 percent of the total gravitational effect. ("The Interpretation of Gravitational Anomalies of the Eastern Regions of the Russian Platform in the Light of Modern Geological and Geophysical Data," by R. F. Volodarskiy, Geography Faculty, Rostov-on-Don University; Moscow, Nauchnyye Doklady Vysshey Shkoly, Geologo-geograficheskiye Nauki, No 2, 1959, pp 216-222)

VIII. ARCTIC AND ANTARCTIC

Principal Results of the Work of the Soviet Marine Antarctic Expedition, 1956-1958

The Complex Antarctic Expedition, composed of a continental and marine division, was organized in June 1955 in connection with the participation of the Soviet Union in the conduct of the IGY.

The aims of the expedition were: (1) the conduct of complex scientific research work in antarctic waters and on the continent of Antarctica for the accumulation of information on the nature of Antarctica, the study of the regularities of natural processes taking place in the large expanses of the Earth for the purpose of developing theoretical problems, and the forecasting of a number of geophysical processes occuring on the Earth, (2) the compilation of a physical-geographical description of Antarctica and its present glaciers, geology, and history; (3) the study of pecularities of aeronavigation in the Antarctic, (4) the study of the sources of raw materials and the search for new regions for the Soviet whaling industry; and (5) the determination of navigational-hydrographical characteristics of the expedition's regions of navigation.

According to this arrangement, the marine portion of the expedition was given the following problems to solve: (1) the study of the atmospheric circulation and the synoptic processes over the south polar regions; (2) the establishment of a general map of the thermal and dynamic regimen of south polar waters affecting the nature of the water and thermal exchange of the adjacent regions of the World Ocean and the atmosphere and the establishment of the quantitative characteristics of these processes for perfecting weather forecasts far in advance; (3) the study of the sea shelves, the ice regime in antarctic waters, and the physical-mechanical properties of antarctic ices for the purpose of ensuring the safety of navigation in these regions; (4) the collection of instrumental data on the elements of waves and currents in south polar waters, with a study of their relationship to the wind and ice regimes; (5) the study of the relief and the geological structure of the ocean bottom in the regions of Antarctica and the hydrographic and cartographic study of the Antarctic coastal regions; (6) the study of the peculiarities of the geophysical phenomena (terrestrial magnetism, gravimetry, and the transmission of radio waves) in the regions of the antarctic waters and on passages to Antarctica; and (7) the study of the zonal distribution of fauna in the ocean, the establishment of the qualitative and quantitative characteristics of fauna in antarctic waters, and the distribution of different types of whales and their feeding areas.

The expeditionary work was conducted by ships specially equipped for complex oceanological and geophysical research. The ships used were the Ob' and Lena. The Ob' carried from 50-90 men, while the Lena carried about 40.

The marine expedition made three voyages on the Ob' between November 1956 and August 1958. Complex research work was conducted during more than 120,000 miles of voyaging in the waters of the Atlantic, Indian, and Pacific oceans. The third voyage was the first round-the-world trip for Soviet scientists.

Oceanological, geophysical, and hydrographical work was conducted in the Indian and Pacific sectors of antarctic waters and along meridional profiles through the Indian Ocean and in the southern part of the Pacific Ocean. Four aerological profiles were made in the Atlantic Ocean up to 30 40 N. During the voyage, 485 complex oceanographic stations, about 90 000 miles of echometer measurements, and 4,600 hydrometeorological observations were made, and more than 700 radiosondes and 420 pilot balloons were launched; wave elements were measured at 140 stations; the elements of marine currents were measured by the electro-magnetic method for 6,000 miles, and ice observations were conducted over a distance of 25,000 miles; various chemical analyses over about 60,000 miles were made; cores of bottom sediments were taken at 335 stations; 200 measurements of the thickness of marine depositions by the seismic-acoustic method were made; more than 300 geophysical stations were made; biologists collected about 3,500 plankton probes, and about 327 bottom dredge and trawl probes were taken; and 7,300 specimens of fish were recorded.

The Ob' and the Lena conducted a cartographic survey of the shore belt between 45 and 129 E and 142 and 166 E, which embraced almost one third of the perimeter of Antartica. Aerial surveying was coordinated by 44 astronomical points and continuous radiogeoditic determinations.

In the field of methodicity, many improvements in the methods and means of marine hydrometeorological observations and oceanological studies were made. The most important of these are: the development and building of a system of antenna stabilization for the meteorological radar station on the Ob', the development of a simplified method of calculating the wind according to the data of the radar station from a moving ship, the construction of actinometric apparatus with remote recording of the transducer readings for all the basic elements of radiation balance on the sea surface, and the creation of an operating model of an actinometric radiosonde. On the third voyage, the method of sounding the atmosphere with meteorological rockets was fully mastered. In the field of oceanological studies, the following developments are noteworthy: a new apparatus and method for direct measurements of radioactivity (down to 200 meters), a

separation method for the collection of mass samples of suspensions in sea water, the construction of a large diameter (300 millimeters) soil corer for ground samples for isotope analysis, and the development of a method of magnetic observations using a tow-raft and a method of maneuvering a ship in oceanographic stations permitting the conduct of deep-water observations with winds up to a scale intensity of 9-10 and over.

The processing of the expedition's materials is now under way. Preliminary conclusions in the separate divisions of aerometeorology, physical and chemical oceanography, geophysics, and cartography and hydrography have been obtained. ("Principal Scientific Results of the Work of the Soviet Marine Antarctic Expedition--1956-1958," by V. G. Kort, Institute of Oceanology, Academy of Sciences USSR; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya, No 5, Sep/Oct 59, pp 3-12)

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